To Design or Not to Design (Part Five):

Doctrine and Design: How Analogies and Design Theory Resist the Military Ritual of Codification

by Ben Zweibelson

Editor's Note: This essay is part five of a six part series *on design.*

It is an unfortunate fact of history that selection and training have developed independently of design problems. They are difficult enough for known machines and known tasks and it is only in very recent years that techniques have developed for task synthesis and extrapolation to skill descriptions.[1]

Due to a traditionally non-systematic approach in the area of learning and assimilation of operational lessons, field commanders and staff officers lacked uniform conventions in both planning and analysis…in most cases the learning process focused exclusively on the tactical field and technical issues.[2]

The invention of writing made standardization and conceptual control of information both possible and necessary as human civilizations passed experiences and values from one generation to the next. "Writing makes possible the codification and systemization of assertion, and hence the birth of *doctrine*."[3] Doctrine originally fused religious ritual with the exclusivity and power of literacy. The educated minority subsequently created effective models for controlling human action, and through both access and knowledge of codified information, limit how the majority could deviate from them. "Ritual…does not succumb to rational argument, erected in favor of political or economic expedients. Religious ritual blunts rational objections in exactly this way."[4] Ontological synthesis of doctrine for this article aims towards the scientific and historical aspects of the doctrinal process instead of ideological values.

From a scientific perspective, this disciplinary method of controlling and teaching human action has many benefits. It reinforces past successful experiences of deceased generations "and

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[1] W.T. Singleton, *Man-Machine Systems* (edited by Open Systems Group), *Systems Behavior, 3rd edition* (London: Harper & Row Publishers, 1981) 125. Singleton"s quote illustrates the repetitive condition the U.S. Army faces when preparing the military organization in peacetime for an expected conflict. More often than not, the war that the Army trained for is not the war the Army gets. Ineffective doctrine only reinforces this negative trend.

[2] Shimon Naveh, *In Pursuit of Military Excellence; The Evolution of Operational Theory* (New York: Frank Cass Publishers, 2004) 220.

[3] Shimon Naveh, Jim Schneider, Timothy Challans, *The Structure of Operational Revolution; A Prolegomena* (Booz, Allen, Hamilton, 2009) 25.

[4] Valerie Ahl and T.F.H. Allen, *Hierarchy Theory: A Vision, Vocabulary, and Epistemology* (New York: Columbia University Press, 1996) 7.

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conserves the effort of retracing their steps." [5] Unfortunately, it also suppresses adaptation, creativity, and deviation from codified doctrine; such actions are expressly *heretical* in nature. [6]

Doctrinal codification is a strong and valid criticism for the military profession as a scientifically supported methodology that continues to provide success at the tactical level. While most military conflict in human history manifests through tactical victories that secured strategic aims, once warfare evolved to the point that single battles could no longer provide strategic victory, the balance changed. The aforementioned Scientific and Industrial Revolutions ushered in the Operational Era of warfare. Yet despite this paradigm shift towards operational levels of warfare, military organizations continued to retain a tactical worldview in most regards, including doctrine. [7]

General Systems Theorist Gerald Weinberg analyzed human propensity for pedantic error correction over contextual evolution in *Rethinking Systems Analysis and Design. "Always examine the possibility that improved spelling may lead to excessive confidence in the text."* [8] Most military professionals have participated in briefings where the preponderance of discourse emphasized superficial changes on PowerPoint slides or „happy to glad" semantic revisions. After several iterations of this ritualistic process, „group-think" emerges where the organization collectively agree on the accuracy of the product *on the basis of doctrinal formatting*. Confidence in the form of the product should not translate into confidence of the *content*. The heretical aspects of *problematization* avoid superficial formatting concerns and instead take aim at meaning, purpose, and metacognition concerning the operation itself. *Problematizing* generates often the most uncomfortable discourse because it potentially dismantles entire projects as victims of inappropriate worldview.

Numerous military historians identify the duality of military culture- the very principles of dedication and uniformity that make the military efficient work against organizational adaptation and creativity. Historian Brian Linn criticizes the military in *Echo of Battle* of resisting change, maintaining "intellectual rigidity, a propensity to mistake slogans for strategic thinking, and the dogmatic belief in itself as the „best trained, best armed, best led force" that has ever existed." [9] Naveh, Schneider, and Challans also make a distinction between what they

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[5] Gerald M. Weinberg, *An Introduction to General Systems Thinking* (New York: John Wiley and Sons, 1975) x.

[6] Australian Head Modernisation and Strategic Planning- Army, *Australian Army's Future Land Operating Concept* (Australian Army Headquarters, Canberra, September 2009) foreword. The Australian doctrine published in 2009 deserves significant praise in deviating from traditional military hubris. The foreword stresses *conceptual and philosophical framework* while the main body of the doctrine credits other military theory and doctrine, and provides extensive flexibility to operators attempting to apply design to complex problems.

[7] Jeff Conklin, *Wicked Problems and Social Complexity* (CogNexus Institute, 2008. http://cognexus.org/wpf/wickedproblems.pdf Last accessed 05 January 2011) 4-5. "This is the pattern of thinking that everyone attempts to follow when they are faced with a problem…this linear pattern as being enshrined in policy manuals, textbooks, internal standards for project management, and even the most advanced tools and methods being used and taught in the organization." United States Army Training and Doctrine Command, *Field Manual 3-0; Operations*. (Headquarters, Department of the Army, 2001), viii. "As with all previous Army capstone doctrine, this doctrine provides direction for the Army and reflects its progress through the years. Like the manual that emerged from Valley Forge, it reflects the lessons learned from combat experience and addresses strategic, operational, and tactical realities." Doctrine prescribes through historical analysis of interpreted successes.

[8] Gerald M. Weinberg, *Rethinking Systems Analysis and Design* (Boston: Little, Brown and Company, 1982) 129.

[9] Brian M. Linn, *The Echo of Battle; The Army's Way of War* (Cambridge: Harvard University Press, 2007) 232; Australian Head Modernisation and Strategic Planning- Army, *Australian Army's Future Land Operating Concept* (Australian Army Headquarters, Canberra, September 2009) 4.15.d.3. Australian design doctrine criticizes the techno-centric military hubris in favor of fostering a learning environment. "Often the most important lessons will come from early identification of people"s mistakes. Consequently, the Land Force needs to reject a „zero defects mentality" in favour of a culture that embraces learning;" Scott Winter*, Fixed, Determined, Inviolable; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 59. "Military conservatism and traditionalism tend to take the form of „dogmatic

consider *designers* and military planners. Military planners are "confined to the „shackles" of inferiority determined by institutional paradigm, doctrine, and jargon…[they] are cognitively prevented, by the very convenience of institutional interiority…because the „shackles" of ritual hold them in place." [10]

Ritualized doctrine essentially prevents adaptation and learning to occur within the design process because the very nature of military doctrine revolves around learning from past conflicts and canonizing select patterns and observations as the prescriptive guidance for future action. [11] Consider the prominence of historical vignettes in much of U.S. Army doctrine. The rationale is obvious; military doctrine prescribes specific patterns of action because in previous conflicts, those patterns were effective. [12] This unfortunately does not work well with military design methodology due to the adaptive nature of open systems.

Design doctrine that attempts to gain veneration based upon historical examples of success demonstrates what French post-modern philosopher Jean Baudrillard terms „dissimulation" over „simulation." Baudrillard explains, "To dissimulate is to pretend not to have what one has. To simulate is to feign to have what one doesn't have." From an ontological perspective concerning open systems, design doctrine *simulates* predictive methodology on the notion that previous design applications were successful. For instance, just because the *Sons of Iraq* „awakening movement" worked in Iraq does not mean that the same sociological process will translate to success in Afghanistan or elsewhere. The uniqueness of each observed system prevents future *pedantic application* of successful transformation approaches on a purely heuristic and reductionist mentality. This frustrates doctrine writers and hierarchal organizations confronting the challenges of institutional learning alike.

The military profession suffers similar institutional roadblocks that the broader scientific and historical disciplines fall victim to. *Internalism* occurs when the military "concern themselves with what goes on inside the discipline, slighting or ignoring its relationship with the surrounding environment." [13] This emphasis on greater levels of specialization has a tendency to close off fields from the rest of the scientific discipline and reduce academic discourse. "Rather than getting a continuous and coherent picture, we are getting fragments- remarkably detailed but

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doctrine;" Trent Scott, *Adapt or Die; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 118. Scott discusses the Australian Army and their inability to act until they collect enough descriptive and reductionist information in the traditional military manner. "Our own culture exacerbates this „can-do" attitude."

[10] Shimon Naveh, Jim Schneider, Timothy Challans, *The Structure of Operational Revolution; A Prolegomena* (Booz, Allen, Hamilton, 2009) 72.

[11] Jeff Conklin, *Wicked Problems and Social Complexity* (CogNexus Institute, 2008. http://cognexus.org/wpf/wickedproblems.pdf Last accessed 05 January 2011) 11. Conklin explains six ways that organizations attempt (erroneously) to „tame" wicked problems; his fourth method observes an organization that will "cast the problem as „just like" a previous problem that has been solved. Ignore or filter out evidence that complicates the picture. Refer to the previous solution of the related problem: „It's just like that problem. Just do the same thing again;" Scott Winter, *Fixed, Determined, Inviolable; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 59. "Rather than sustaining an atmosphere of continuous professional debate, the existence of and reliance on doctrine may stifle innovative thought. Military doctrine by its very nature aims to capture the hard-earned lessons of the past."

[12] John Brown, (Edited by Michael Krause, Cody Phillips), *The Maturation of Operational Art; Historical Perspectives of the Operational Art* (Center of Military History, United States Army, 2007) 442. "The 1986 edition of Field Manaul (FM) 100-5, *Operations,* deployed an array of historical operational vignettes to make its points; such terms as Center of Gravity, Lines of Operation, and Culminating Point were recommended as key concepts for operational design." Chris Smith, *Solving Twenty-First Century Problems with Cold War Metaphors; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 92. Smith criticizes the Australian military for clinging to mechanical metaphors such as „center of gravity" to attempt to solve complex problems.

[13] Peter Novick, *That Noble Dream* (New York: Cambridge University Press, 1988) 9.

isolated patterns." [14] While the military has components that are remarkably effective at counterterrorism, those organizations learn and adapt in isolation from other elements such as conventional armor components, or fixed wing disciplines. Consider how doctrine even within a service often contains contradictory positions on rival actors such as *insurgents*.

For example, U.S. Army unconventional warfare (Special Operations) doctrine casts *insurgents* in a far more positive light in their doctrine than does FM 3-24 *Counterinsurgency*, which refers to insurgents as „unscrupulous"[15] actors that „thrive on terrorizing and intimidating the population to gain control."[16] The fact that two specialized components within the military science discipline cannot codify their respective doctrine to agree on what an insurgent is demonstrates how fragmented and over-specialized an institution can become. Holistically, special operations and counterinsurgent operators are just codifying in their respective doctrine their distinct worldviews; the insurgent's weapon merely points in different directions in each.

With military doctrine lacking a holistic approach, the trend of tacticizing military design methodology through FM 5-0 is problematic. Military practitioners are prone to a similar pitfall that historians face concerning objectivity. Postmodernist Hayden White reflected on how historians promote their work as objective and explanatory whereas their methodology is far more polemical and guided by their own generational mimesis:

"Actually, however, human beings can will backward as well as forward in time; willing backward occurs when we rearrange accounts of events in the past that have been emplotted in a given way, in order to endow them with a different meaning or to draw from the new emplotments reasons for acting differently in the future from the way we have become accustomed to acting in our present." [17]

White's historian is isomorphic to the military institution's doctrine writers. [18] The military discipline moves forward in time while reflecting back upon previous conflicts and, through the tinted lens of institutional values and military culture, rearranges accounts of prior conflicts to endow them with new meanings that promise continued relevance in the next conflict. Once these altered retrospections match military values and core tenets, they are codified into prescriptive doctrine to guide the military forward into the unknown.

Military doctrine follows the core tenets of discipline and uniformity for the same reason that doctrine avoids metaphors and analogies. Doctrine prefers either prescription or description because military efficiency often hinges upon uniform and consistent behavior throughout an organization. [19] In order for an infantry platoon in Hawaii to enter and clear a building precisely

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[14] Ervin Laszlo, *The Systems View of the World; a Holistic Vision for Our Time.* (New Jersey, Hampton Press, 1996) 2-3; Jeff Conklin, *Wicked Problems and Social Complexity* (CogNexus Institute, 2008. http://cognexus.org/wpf/wickedproblems.pdf Last accessed 05 January 2011) 14. "Social complexity doesn't stop with individual diversity- each of these players comes from a different discipline, with its own specialized language and culture…these players represent different organizations. Each organization has its own function and charter, its own goals…these organizations often have divergent goals."

[15] FM 3-24; Counterinsurgency (June 2006 Final Draft; Headquarters, Department of the Army). 1-3.

[16] Ibid. preface.

[17] Hayden White, *The Content of the Form* (Baltimore: The John Hopkins University Press, 1987) 150.

[18] Ludwig Von Bertalanffy, *General System Theory- A Critical Review* (edited by Open Systems Group), *Systems Behavior, 3rd edition* (London: Harper & Row Publishers, 1981) 67. Bertalanffy uses the terms „isomorphism," „logical homology", and „analogy" interchangeably with General System Theory.

[19] Shimon Naveh, *Asymmetric Conflict; An Operational Reflection on Hegemonic Strategies* (Tel Aviv: The Eshed Group for Operational Knowledge, 2005) 20. "Military institutions have traditionally engaged [military problems] with their array of ready-made conventional conceptions, existing structural organizations, generic methods of operation, and universal learning practices."

the same way another platoon in Germany or Washington does, military doctrine regarding Military Operations in Urban Terrain (MOUT) provides clear, prescriptive description that is devoid of conceptual ambiguity such as metaphor. Were *Field Manual 90-10, Military Operations in Urban Terrain (MOUT)* to state, „clearing a building is akin to weeding a garden; friendly forces must eliminate all of the weeds without disturbing the vegetables growing there," the military organization might interpret building clearing in dissimilar ways. "Primarily on the basis of linguistic evidence, we have found that most of our ordinary conceptual system is metaphoric in nature…we act according to the way we conceive of things." [20]

In the interests of uniformity and discipline, metaphors and other abstractions are deliberately not present in military doctrine. For tactical applications and detailed planning, this is perfectly acceptable. Were military organizations to employ metaphoric constructs with tangible, sequential tasks such as clearing a building, individuals across the organization might conceptualize „weeding a garden" differently. Units could potentially develop non-uniform and potentially irregular methods of performing the same task. This is a valid concern, but it implies a lack of understanding by the military institution on how analogies function. In other words, Gerald Weinberg remarks in *An Introduction to General Systems Thinking:* "if you cannot think of three ways of abusing a tool, you do not understand how to use it." [21] If doctrine expects its audience not to take historical vignettes literally, analogous content could expect similar treatment.

Instead, military doctrine applies rigid structure, clear and often highly prescriptive language, detailed graphical depictions, and numerous successful examples through historical vignettes. This reinforces the aforementioned human desire to "project upon the world an ideal plan that will then have to be incorporated into factual reality." [22] This reductionist teleological methodology functions for tactical processes, but it is not an effective model for military design applications dealing with complexity.

"In science as in poetry, the essential quality is not the finished metaphor itself, but the *process of transformation,* this is, the *process* of making the metaphor. And as the fabric of poetry or science is made, metaphors may be built upon metaphors, functions upon functions." [23]

Open systems reflect a level of abstraction that requires exploring the unknown through creativity, metacognition, and „out of the box" thinking as opposed to rigid doctrine. When a metaphor on weeding a garden potentially creates havoc and irregularities concerning the tangible task of clearing a building in MOUT, the same metaphor potentially conveys understanding and visualization of an abstract phenomenon in conceptual planning. *General Systems Theory,* potentially a strong parental candidate for the intellectually orphaned U.S. Army design, considers use of analogy critical for open systems metacognition. "[General Systems Theory"s] aim is not more or less hazy analogies; it is to establish principles applicable to entities

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[20] George Lakoff and Mark Johnson, *Metaphors We Live By*. (Chicago: The University of Chicago Press, 2003), 3-5; Justin Kelly and Mike Brennan,*OODA Versus ASDA: Metaphors at War; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 43. All metaphors are "incomplete and only partially appropriate representation of the phenomenon it purports to characterize."

[21] Gerald M. Weinberg, *An Introduction to General Systems Thinking* (New York: John Wiley and Sons, 1975) 196.

[22] Francois Jullien (translated by Janet Lloyd), *A Treatise on Efficacy Between Western and Chinese Thinking*. (Honolulu: University of Hawai"i Press, 2004), 3.

[23] Gerald M. Weinberg, *An Introduction to General Systems Thinking* (New York: John Wiley and Sons, 1975) 142.

not covered in conventional science."[24] Design requires usage of analogy or isomorphy due to the structural similarities within an open system that often cause operators in different specialties and locations to arrive at similar conclusions. [25]

If FM 5-0 design doctrine is conceptually unwieldy due to the prescriptive and rigid nature of military institutionalism, is there an alternative? „To Design or Not to Design" proposes that instead of pigeonholing military design methodology into traditional doctrine codification, a more asymmetrical approach is necessary. To accomplish this, military design methodology must abandon current form as a scant 15-page chapter in FM 5-0 and morph into a significantly different format. Applying the principle arguments of this series of articles on military design methodology, U.S. Army design requires unique vocabulary, rich explanation concerning the various conceptual aspects of open systems, non-linear approaches to transforming a system, and extensive application of analogies to convey *understanding* of design methodology to the target audience. [26]

This alternate design doctrine requires an avoidance of the aforementioned tenets of objective military doctrine; uniformity and discipline through prescriptive and description. "It is obvious…that any approach able to deal with the changing complexity of real life will have to be flexible. It could never be reduced to a sequence of steps…it needs to be flexible enough to cope with the fact that every situation involving human beings is unique."[27] This means that abstraction is rule instead of the exception, and the forbidden conceptual tools in objective doctrine such as analogy and non-prescriptive creativity become the favored means. [28]

"Social phenomena *are* capricious. They are necessarily expressed in abstract terms, and are subject to multiple and changing interpretations."[29] In order for designers to achieve shared understanding and subsequently convey meaning and explanation to the rest of the military organization, they must *communicate* abstraction through familiar forms. Metaphors and analogies provide ideal conceptual vehicles for this express purpose. "What is important is not to *stop* with rough analogy when the occasion demands that we go on, but to render the analogy into a precise, explicit, and predictive model."[30] Designers are charged with developing analogies to generate explanation and understanding to the rest of the military organization.

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[24] Ludwig Von Bertalanffy, *General System Theory- A Critical Review* (edited by Open Systems Group), *Systems Behavior, 3rd edition* (London: Harper & Row Publishers, 1981) 67.

[25] Kenyon B. De Greene, *Systems and Psychology* (edited by Open Systems Group), *Systems Behavior, 3rd edition* (London: Harper & Row Publishers, 1981) 87-88. De Greene uses the term „isomorphy" to describe isomorphism. "The concept of isomorphism suggests that various fields of science can be united at basic levels through underlying principles;" Justin Kelly and Mike Brennan, *OODA Versus ASDA: Metaphors at War; Australian Army Journal For the Profession of Arms, Volume VI, Number 3* (Duntroon: Land Warfare Studies Centre, 2009) 48. "That is, which metaphor is more likely to prompt decision-makers to search the right places in the underlying body of theory;" Ian Stewart, *Nature's Numbers* (BasicBooks, 1995) 88. "This universality of symmetry breaking explains why living systems and nonliving ones have many patterns in common."

[26] Jeff Conklin, *Wicked Problems and Social Complexity* (CogNexus Institute, 2008. http://cognexus.org/wpf/wickedproblems.pdf Last accessed 05 January 2011) 8. "There are so many factors and conditions, all embedded in a dynamic social context, that no two wicked problems are alike, and the solutions to them will always be custom designed and fitted."

[27] Peter Checkland and John Poulter, *Learning for Action; A short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers, and Students.* (England: John Wiley & Sons Ltd, 2006), 6.

[28] Kenyon B. De Greene, *Systems and Psychology* (edited by Open Systems Group), *Systems Behavior, 3rd edition* (London: Harper & Row Publishers, 1981) 99. "In operational situations we find it necessary to deal with factors like judgment and intuition that have long been pariahs to objective psychology…Clearly what is needed is a *general* and *flexible* approach, adaptable to different problems, levels, times, and environments."

[29] Checkland , 176.

[30] Gerald M. Weinberg, *An Introduction to General Systems Thinking* (New York: John Wiley and Sons, 1975) 31.

Design planning teams are fundamentally comprised of individuals that must construct for the organization "the meaning of the other''s messages and must design messages whose meanings the other can decipher. When this process works well, it is a kind of reciprocal construction that results in convergence of meaning."[31] U.S. Army design doctrine should free itself from the shackles of institutional dogma and adapt metaphoric content as extensively as historical vignettes function in detailed planning doctrine.

FM5-0 Chapter 3 Design makes multiple references to „graphic descriptions" that will accompany narratives in the environmental frame, problem frame, and operational approach. In the brief 15 pages within FM 5-0, design doctrine provides no examples of these graphic descriptions. The complete absence of example graphics may indicate fear that any example could generate prescriptive reaction from military organizations. Yet without any form of visualization aids, abstract concepts such as *problematize* and *transforming the system* become potentially even more difficult for an organization to grasp. Analogous to architectural students, to balance creative inspiration with rational function and form, architectural programs generally expose students to many diverse examples. [32] Students that merely plagiarize by imitating existing successful designs do not learn, while students that combine novel creativity with appropriately inspired forms and function are successful. Military design doctrine requires substantial design graphical depictions in order to achieve similar results.

Military design requires graphic depictions because humans are visual thinkers. While the design narrative is essential, a well-designed graphic helps convey understanding. "Such drawing is done by the designer not to communicate with others but rather as part of the very thinking process itself which we call design."[33] A divergent series of example graphics would avoid the pitfall of prescription through quantity and quality of example. Provided the series of products takes imaginative and asymmetrical approaches to graphic depiction, creative planners could select various aspects of select graphics and combine them into endless new combinations to visualize and understand abstract concepts. Just as artists visit museums not to imitate other works of art but to seek inspiration, designers should not suffer the current form of *FM5-0 Chapter 3 Design* that exists as an empty museum with only blank walls.

FM 5-0 currently features a mere fifteen pages dedicated to a new methodology on „problem-solving." Although this series of articles on design suggests numerous changes in vocabulary, alternate concepts concerning design theory, this fourth article on design doctrine makes perhaps the boldest suggestion. Design methodology, in order to be taken seriously by the military institution, requires its own exclusive field manual. Not only does design methodology literally need more room to expand upon the design process, military design requires exception from traditional doctrinal procedures and regulation. [34] Design doctrine in proper form should

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[31] Donald A. Schon, *Educating the Reflective Practitioner.* (San Francisco: Jossey-Bass, 1987)96.

[32] Gerald M. Weinberg, *Rethinking Systems Analysis and Design* (Boston: Little, Brown and Company, 1982) 17. "The architect generally has thousands of successful earlier designs to study and emulate, whereas the systems analyst/designer may have none." Creativity and adaptation become more critical for designers the further they move away from institutional knowledge and recognizable patterns; doctrine and institutional dogma likely hinder efforts to explain a system under these conditions.

[33] Checkland , 26.

[34] Australian Head Modernisation and Strategic Planning- Army, *Australian Army's Future Land Operating Concept* (Australian Army Headquarters, Canberra, September 2009) 1-6. Australian military doctrine published in 2009 deserves significant recognition with their conceptual planning doctrine published in 2009. Although vigorously citing Clausewitz on the same page, *Adaptive Campaigning- the Future Land Operating Concept* states that the doctrine is "not a prescriptive manual describing methods of execution; rather it is conceptual in its approach…as such, AC-FLOC *should be regularly reviewed and the logic*

look unlike any other U.S. Army military manual- this is a good thing. In order to prevent continued tacticization of design methodology and isolate dual-use terminology and vocabulary, design doctrine must clearly possess form and function entirely unlike existing field manuals. The concluding article for „To Design or Not to Design‟ summarizes this key point as well as the many other suggested changes in order to promote institutional learning of this valuable alternative methodology.

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refreshed to ensure its validity and relevance(emphasis added)." Doctrine that recommends regular review and revision appears almost heretical; future U.S. Army design doctrine should take notice.